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EXAMINER	
NGUYEN, CUONG H	

ART UNIT	PAPER NUMBER
3661	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/784,341	BECK ET AL.	
	Examiner	Art Unit	
	CUONG H. NGUYEN	3661	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *17 December 2007*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-53* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-19* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☒ Claim(s) *1-53* are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on _____ is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

1. This Office Action is the answer to the "Appeal Brief" filed on 12/17/2007, which paper has been placed of record in the file.

2. Claims 1-53 are pending in this application; wherein claims 1-19 (Group I) are elected for examination on 12/17/2007 with traverse.

Response

3. The examiner withdraws his previous rejections under 35 U.S.C. 112, second paragraph for claims (mailed on 10/24/2007), and proceeding with art rejections – because the BPAI's decision for patentable of an application can not only rely on 35 USC 112, 2nd paragraph rejections. Since the applicants explain that "…any vehicle, has a "state" in which it exists. This is a fundamental fact of existence…" (see the Appeal Brief filed on 12/17/2007, page 14, lines 9-10) and linking that to the pending disclosure "…shifting …articulable mass of the vehicle 100…, to achieve the desire vehicle state." (see the Appeal Brief filed on 12/17/2007, page 14, lines 25-28), the examiner keeps this in mind to examine what the applicants claim as their own intellectual property (actually, based on what explains above, this is a fundamental fact of existence, as applicant admits).

The applicants also admit that "…damping is a part of articulation …" (see the Appeal Brief filed on 12/17/2007, page 15, lines 12-13); that means any articulation already/inherently includes this claimed damping characteristic.

Note: A restriction for examination purposes as indicated in prior Office Action is proper because all these inventions listed in this action (as in pending claims 1-53) are independent or

distinct for the reasons given above and there would be a serious search and examination burden if restriction were not required because one or more of the following reasons apply:

(a) the inventions have acquired a separate status in the art in view of their different classification;

(b) the inventions have acquired a separate status in the art due to their recognized divergent subject matter;

(c) the inventions require a different field of search (for example, searching different classes/subclasses or electronic resources, or employing different search queries);

(d) the prior art applicable to one invention would not likely be applicable to another invention;

(e) the inventions are likely to raise different non-prior art issues under 35 U.S.C. 101 and/or 35 U.S.C. 112, first paragraph.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. § 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless --

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. Claims 1-4, 9-10, 14-15, 17-18 are rejected under 35 U.S.C. § 102(b) as being anticipate by Heyring et al. (US Pat. 6,010,139).

A. As to claims 1-2: Heyring et al. teach a method of controlling stability of a vehicle having an articulated suspension, comprising: determining a dynamic property of the vehicle; and manipulating the articulated suspension based on that dynamic property (e.g., in this case that

dynamic property is vehicle's velocity/speed) to affect the stability of the vehicle, see Heyring et al., col. 2, line 58 to col. 3 line 16).

B. As to claim 3: Heyring et al. teach that manipulating the articulated suspension to affect a center of gravity of the vehicle (see Heyring et al., col. 2 lines 58-62).

C. As to claim 4: Heyring et al. disclose that manipulating the articulated suspension to affect stability limits of the vehicle (see Heyring et al., col. 1 lines 13-17).

D. As to claim 9: Heyring et al., disclose "Detailed Description Text (3):

As shown in FIG. 1, the ram is functionally related to the front left wheel while ram 2 is similarly associated with the front right wheel. Ram 3 is associated with the rear right hand side wheel while ram 4 is located between the rear left wheel and the chassis. The front of the vehicle is therefore represented towards the top of the page."

Heyring et al., already take into consideration when manipulating the articulated suspension of a wheel suspension with respect to a chassis of the vehicle

E. As to claims 10, and 14: Claim 10 requires a step of actively damping the articulated suspension.

Claim 14 requires steps of:

determining a damping scenario; and

adjusting damping levels.

The applicant admits that "…damping is a part of articulation …" (see the Appeal Brief filed on 12/17/2007, page 15, lines 12-13); that means any articulation already/inherently includes this claimed damping characteristic; therefore, Heyring et al., teach about a step of manipulating the articulated suspension comprises actively damping the articulated suspension

(note that a limitation for claim 14 is "determining a damping scenario, and adjusting damping levels of active dampers) – an inherently characteristic of claimed articulation because "manipulating" then "sending command signals" means "actively determining", and "actively adjusting" damping features.

F. As to claims 14-15, and 17: Heyring et al., inherently teach a method of controlling stability of a vehicle having an articulated suspension, comprising: determining a damping scenario; and adjusting damping levels of a plurality of active dampers of the articulated suspension.

Heyring et al. also teach about using articulated suspension, comprising:

- determining a damping scenario (see Heyring et al., col. 7 lines 30-36;"… can occur depending on wheel base length, distance between bumps, speed, damping rates, spring rates and physical location of the rams with regard to the wheel geometry, for example." – *from these descriptions, at least, vehicle's speed is considered as a damping scenario by Heyring et al.), and adjusting damping levels of active dampers by a load equalization unit 13 (see Heyring et al col. 8 lines 20-26, "…* fluid communication with chambers 14 and 17 within the opposed cylinder portions of the load equalisation unit 13. If an obstacle (such as a speed hump) is encountered by both front wheels simultaneously, fluid will become expelled out of the upper chambers 1a and 2a."

G. As to claims 17-18: Heyring et al. teach a step of sensing a dynamic response of the vehicle (i.e., sensing a vehicle's speed) and analyzing the sensed dynamic response (i.e., using a vehicle's speed to adjust a damping level).

Therefore, Heyring et al. teach a method of controlling stability of a vehicle, and obviously sensing/detecting a dynamic response.

Claim 18 requires a limitation of: sensing a dynamic response of a damping action (for this requirement, Heyring et al. obviously suggest that "The damper also can be used to delay the responses and interactions between the front and back axle" (e.g., based on a wheel's position) – see Heyring et al., col. 10 lines 15-40.

Claim Rejections - 35 USC § 103

5. Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Heyring et al. (US Pat. 6,010,139), in view of Schofield et al., (US Pub. No. 20030001734 A1).

Heyring et al. teach a method to manipulating the articulated suspension as claimed.

Heyring et al. do not disclose about using GPS data to affect that manipulating articulated suspension.

However, Schofield et al. teach that feature (see Schofield et al., para. [0116]) providing "attitude and a location of the vehicle" information as claimed.

Thus, practitioner in the art at the time of the invention would have found it is obvious to combine the feature as disclosed by Schofield et al. with Heyring et al. because GPS remotely provides an accurate object's attitude and location that would clearly effect a vehicle's stability remotely.

6. Claims 6, and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Heyring et al. (US Pat. 6,010,139), in view of Wilcox et al., (US Pat. 6,267,196 B1)

Heyring et al. teach a method to manipulating the articulated suspension.

Heyring et al. do not disclose about manipulating the articulated suspension based upon the sprung and the unsprung mass.

However, Wilcox et al. suggest about using those sprung mass, and unsprung weight/mass in stability calculation (these weights effect a vehicle's mass).

Thus, practitioner in the art at the time of the invention would have found it obvious to combine the feature as disclosed by Wilcox et al. with Heyring et al. because it is a goal to minimize the unsprung weight/mass: e.g., that which is not carried by the suspension - a reduction of the sprung mass will generally have a tendency to lower the vehicle's center of gravity, and thereby increase its stability. It is therefore advantageous that the relatively heavy drive motors be included in the unsprung mass of the vehicle.

7. Claims 7-9, 13, 16, and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Heyring et al. (US Pat. 6,010,139), in view of Soo Hoo (US Pat. 4,313,511).

A. As per claims 7-8: Claims 7-8 require a step of using a physic model of a vehicle to estimate/determine suspension.

Heyring et al. teach a method to manipulating the articulated suspension as claimed.

Heyring et al. do not disclose about using a physic model of the vehicle to estimate/determine suspension.

However, Soo Hoo discloses that: *"The hydraulic linking coordinates the geometry of the side and rear wheels. This change creates a constant preload that, for the most part, is a function of selected load distribution cylinder size. By tying together the push end of the cylinders, the articulated suspension geometry varies between wheels and the rear wheel to distribute the load. In effect, the coupled rear wheel and side wheel assemblies complement each other and perform as a unit. Mathematically, the indeterminacy in modeling the system before the introduction of hydraulics is eliminated. The load distribution for such a configured system is completely*

determinant and computed as easily as for a conventional automotive layout. The hydraulic link couples the reaction in the side wheels and rear wheel, leaving the common pressure between, to be computed to resolve both reactions."/

It would have been obvious with one having ordinary skill in the art to implement Heyring et al.'s disclosure with a step of using a real-time physic model of the vehicle as taught by Soo Hoo to estimate/determine suspension because a result from that modeling is well-known to be very helpful for selecting a quick and close parameter for use in realty.

B. As to claims 9, and 13: A claimed step is required: "articulating wheel assemblies with respect to a chassis of the vehicle (to substantially level loads on the plurality of wheel assemblies)", in this method claim "to substantially level loads on the plurality of wheel assemblies" is an obvious result of the previous claimed clause "articulating wheel assemblies with respect to a chassis of the vehicle".

Soo Hoo also discloses in Detailed Description Text (4): "In order to form a triple track support for the vehicle 10, a right side wheel assembly 23 is mounted on the frame 14 spaced slightly to the front of the rear wheel assembly and spaced rightwardly outwardly from the longitudinal central axis of the frame 14. The assembly 23 has a right side wheel 24 supported by means of a right side articulated swinging-link swept-back suspension 25. Similarly, a left side wheel assembly 26 is mounted on the chassis and extends leftwardly outwardly therefrom opposite the right side wheel assembly 23. The left side wheel assembly 26 has a left side wheel 27, and journaled for rotation thereon and being supported from the frame 14 by means of a left side articulated swinging-link swept-back suspension 28.".

From Soo Hoo 's above disclosure, the examiner submits that it is obvious because Soo Hoo suggests to transfer a balance to wheel assemblies with respect to a vehicle's chassis for leveling a change in load.

C. As to claims 16, and 19: Heyring et al. teach a method of controlling stability of a vehicle having an articulated suspension, comprising: determining the damping scenario (i.e., on a rough surface/based on a road condition) and adjusting the damping levels are carried out based upon a predictive model (see Heyring et al. disclose (col. 10 lines 15-40) "The damper unit should be regarded as an important optional component as it permits the tuning of specific functions in the suspension system. The damper also can be used to delay the responses and interactions between the front and back axle so that inputs at sensitive frequencies resulting from wheel base length road conditions do not upset vehicles smooth passage. Dampers may also take the form of (optionally variable) restrictors 9b, 9c, 12b, 12c, 11b, 11c, 10b, 10c within the conduits, which permit the individual tuning of the various components. For example, when the restrictor-dampers 9b, 10b, 11b, 12b are introduced, fluid is restricted from communicating with the lower chambers 1b, 2b, 3b, 4b so that the resilient effects of the load distribution unit 13 are maximised. Conversely, when the dampers 9c, 10c, 11c, 12c are mainly used this prevents the free communication of fluid from the rams to the load distribution unit and encourages fluid to act upon the lower ram chambers 1b, 2b, 3b, 4b with very different consequences. Adjusting the balance of the restrictions exerted by restrictors 9b, 10b, 11b, 12b with reference to restrictors 9c, 10c, 11c, 12c provides the ability to allow for the appropriate tuning of the total damping forces acting on the vehicle. Such tuning can also be accomplished through the careful selection of

conduit sizes to provide the appropriate amount of friction to arrive at similar damping responses." Heyring et al. teach a method to manipulating the articulated suspension as claimed.

Heyring et al. do not disclose about using a physic model of the vehicle to estimate/determine suspension. The examiner's position is that disclosing "…effects of the load distribution unit 13 are maximised" that means maximizing a load in calculation is a predictive task.

Soo Hoo also discloses that: *"The hydraulic linking coordinates the geometry of the side and rear wheels. This change creates a constant preload that, for the most part, is a function of selected load distribution cylinder size. By tying together the push end of the cylinders, the articulated suspension geometry varies between wheels and the rear wheel to distribute the load. In effect, the coupled rear wheel and side wheel assemblies complement each other and perform as a unit. Mathematically, the indeterminacy in modeling the system before the introduction of hydraulics is eliminated. The load distribution for such a configured system is completely determinant and computed as easily as for a conventional automotive layout. The hydraulic link couples the reaction in the side wheels and rear wheel, leaving the common pressure between, to be computed to resolve both reactions".*

It would have been obvious with one having ordinary skill in the art to implement Heyring et al.'s disclosure with a step of using a real-time physic model of the vehicle to estimate/determine suspension as taught by Soo Hoo because a result from that modeling is well-known to be very helpful for selecting a quick and close parameter for use in realty.

8. Claims 11-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Heyring et al. (US Pat. 6,010,139), in view of Horan (US Pat. 4,243,278).

Horan further suggests about having an apparatus taking into account a mast, and a turret that could effect to a stability of an articulated device.

The examiner submits that it is obvious for articulating components mounting on a vehicle (e.g., a turret - a rotation structure for observation or holding weapons), and a mast of the vehicle (e.g., any sturdy upright pole) with respect to a chassis of the vehicle.

It would have been obvious with one having ordinary skill in the art to implement Heyring et al. with suggestions from Horan about having an apparatus taking into account a mast, and a turret that could effect to a stability of an articulated device because both of them are creating successful articulated devices with a mast, and Horan adds a rotating object that still keep his device stable.

Conclusion

9. Elected claims 1-19 are not patentable.

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to CUONG H. NGUYEN whose telephone number is 571-272-6759. The examiner can normally be reached on 9:30 am - 5:30 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, THOMAS G. BLACK can be reached on 571-272-6956. The Rightfax number for the organization where this application is assigned is 571-273-6956.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Please provide support, with page and line numbers, for any amended or new claim in an effort to help advance prosecution; otherwise any new claim language that is introduced in an amended or new claim may be considered as new matter, especially if the Application is a Jumbo Application.

/CUONG H. NGUYEN/
Primary Examiner